

# NASA TECH BRIEF

## *Marshall Space Flight Center*



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### Snap Dynamics

#### The problem:

A fast and economically efficient method was needed to calculate the normal vibration modes of complex structures. Available methods required excessively large amounts of input data, run time, or core storage.

#### The solution:

A program was developed specifically to eliminate the problems mentioned above.

#### How it's done:

Computer run time is minimized by reducing to a minimum the number of operations within the machine and the amount of data transferred to and from the secondary storage.

Both run times and storage requirements are reduced by considering only the non-zero elements of the matrices and by taking advantage of all the symmetry conditions. Pseudo inverse and iteration are used to find only the needed modes.

The data input is a group of data libraries, and the structure is visualized as a structural network. A series of accuracy checks are made with each iteration and

printed out for the user. Provision for accuracy improvement is also included.

#### Notes:

1. This program was written in FORTRAN V for use on the UNIVAC 1108 computer. Program options permit the use of an SC-4020 plotter.
2. Inquiries concerning this program should be addressed to:

COSMIC  
112 Barrow Hall  
University of Georgia  
Athens, Georgia 30601  
Reference: MFS-21531

#### Patent status:

No patent action is contemplated by NASA.

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